

April 22, 2004

MEMORANDUM TO: L. Raghavan, Chief, Section 1  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: John G. Lamb, Project Manager, Section 1 /RA/  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: MEETING SUMMARY BETWEEN THE NUCLEAR REGULATORY  
COMMISSION STAFF AND STAKEHOLDERS CONCERNING  
GENERIC SAFETY ISSUE (GSI) 191, "ASSESSMENT OF DEBRIS  
ACCUMULATION ON [PRESSURIZED-WATER REACTOR] PWR  
SUMP PERFORMANCE" (TAC NO. MA6454)

On March 23 and 24, 2004, the Nuclear Regulatory Commission (NRC) staff met with the Nuclear Energy Institute (NEI), utility groups, and other stakeholders at NEI Headquarters concerning Generic Safety Issue (GSI) 191, "Assessment of Debris Accumulation on [Pressurized-Water Reactor] PWR Sump Performance." Attachments 1 and 2 lists the meeting attendees for March 23 and 24, respectively. A public meeting notice was issued on February 26, 2004, and was posted on the NRC's external (public) web page (ADAMS Accession No. ML040500387). The notice included the meeting agenda; however, the meeting agenda was revised based on discussions between the NRC staff and the NEI staff. Attachment 3 contains the revised detailed meeting agenda. The NRC staff recognizes that the meeting agenda was revised after the meeting notice was issued. The NRC staff submitted a Process Improvement Form to the Office of Nuclear Reactor Regulation Process Improvement Program.

The purpose of the meeting was to discuss the draft NEI pressurized-water reactor (PWR) Containment Sump Evaluation Methodology, and the NRC comments regarding the NEI PWR Containment Sump Evaluation Methodology regarding GSI-191.

This was a Category 2 Meeting. At the conclusion of the business portion of the meeting, the public was invited to participate in this meeting and ask questions of the NRC staff or make comments that they feel are appropriate. The agenda contained in the published meeting notice had two designated points for stakeholder questions on March 23. The revised agenda (Attachment 3) had one designated point for stakeholder questions; however, several opportunities were offered to stakeholders for questions or comments.

On March 23, the agenda for the meeting consisted of (1) opening remarks and introductions, (2) meeting objectives, (3) Industry presentation of the Industry PWR Containment Sump Evaluation Guidance, (4) discussion of risk-Informed treatment of sump performance, and (5) questions from stakeholders.

The NRC staff stated the following meeting objectives:

1. Understand the Industry PWR Containment Sump Evaluation Methodology with the Baseline Analysis,
2. Understand the differences between the NEI PWR Containment Sump Evaluation Methodology submitted October 31, 2003, and the proposed Industry PWR Containment Sump Evaluation Methodology with the Baseline Analysis,
3. Discuss the Risk-Informed Treatment of Sump Performance,
4. Understand the Industry Supplemental Guidance,
5. Discuss the NRC Draft request for additional information (RAI) Questions,
6. Understand which actions the Industry will address and which actions the Industry will not address, and
7. Understand when the Industry will respond to the NRC RAI questions.

On October 31, 2003, NEI sent the "Draft of PWR Containment Sump Evaluation Methodology" (ADAMS Accession Nos. ML033090434 and ML033090448). On February 9, 2004, the NRC staff sent a letter to NEI regarding its results of the preliminary review of NEI's "First Draft" of the " PWR Containment Sump Evaluation Methodology" (ADAMS Accession Nos. ML040410438 and ML040410446).

Attachment 4 contains NEI presentation, "GSI-191 Evaluation Methodology Overview." This Evaluation Methodology represents a substantial change from the Evaluation Methodology dated October 31, 2003. The Industry GSI-191 Evaluation Methodology proposes to use a Baseline analysis approach. The Industry Baseline analysis approach proposes to use a simplified set of analysis guidelines with a high level of conservatism and to be performed by each PWR licensee.

Attachment 5 contains the Industry presentation, "Overview of the Baseline Document."

Attachment 6 contains the Industry presentation, "PWR Containment Sump Baseline Evaluation Methodology - Break Selection."

Attachment 7 contains the Industry presentation, "PWR Containment Sump Baseline Evaluation Methodology - Debris Generation."

Attachment 8 contains the Industry presentation, "PWR Containment Sump Baseline Evaluation Methodology - Latent Debris."

Attachment 9 contains the Industry presentation, "PWR Containment Sump Baseline Evaluation Methodology - Debris Characteristics."

On March 4, 2004, the NRC staff responded to NEI's proposals for determining limiting pipe break size used in assessing debris generation following a design-basis loss-of-coolant accident (LOCA) (ADAMS Accession No. ML040410433). In the letter, the NRC staff stated the following:

Although the NRC staff does not endorse proposals submitted by NEI for use of [leak-before-break] or fracture mechanics, the NRC staff plans to discuss, in public meetings, the use of current or planned work to risk-inform Title 10, *Code of Federal Regulations*, Section 50.46, "Acceptance criteria for emergency core cooling system for light-water nuclear power reactors," as a suitable technical basis for defining a spectrum of break sizes for debris generation and containment sump strainer performance.

A discussion was held regarding the risk-informed treatment of sump performance. The plan being considered is to use the expert elicitation being conducted by the NRC Office of Research as the technical basis to justify a new maximum design-basis LOCA. The newly outside-of-design basis LOCAs would then be handled through Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis (ML003740133) (Issued with Standard Review Plan Chapter 19) (Draft DG-1061, ML003739197, issued 06/1997) (Draft DG-1110, Proposed Revision 1, issued 06/2001) (Revision 1, issued 11/2002, ML023240437)," or in severe accident management space. A discussion was held regarding this "alternate break size" approach proposed to be used in plant-specific evaluations to estimate debris generation for GSI-191. Discussion focused on whether this "alternate break size" approach could be accomplished within the current resolution schedule for GSI-191. NRC and NEI agreed that further discussions and meetings are warranted regarding this topic.

On March 24, the agenda for the meeting consisted of (1) opening remarks and introductions, (2) Industry presentation of the Supplemental Guidance, (3) Industry discussion of the NRC draft RAI questions, and (4) questions from stakeholders.

Attachment 10 contains the NEI presentation, "GSI-191 Evaluation Methodology Supplemental Guidance."

Attachment 11 contains the NRC draft RAI questions regarding the NEI Draft PWR Containment Sump Evaluation Methodology Guidelines. On February 9, 2004, the NRC staff sent a letter to NEI regarding the preliminary review of the NEI's Draft PWR Containment Sump Evaluation Methodology (ADAMS Accession No. ML040410438). The letter stated the following:

Please apply the level of effort necessary to provide a complete, nondraft version of the methodology by April 15, 2004. Our schedule requires that we have the final methodology transmitted to us by July 15, 2004.

The NRC staff told NEI to address the RAI questions contained in Attachment 11 instead of the February 9, 2004, letter. Attachment 12 contains a "Cross-Reference Between Detailed RAI's and Preliminary Review of NEI's Draft PWR Containment Sump Evaluation Methodology Guidelines." NEI stated that NEI and the Industry understand the NRC RAI questions and no clarifications were required.

The March 24 meeting was scheduled to end at noon; however, NRC and NEI decided to extend the meeting to 3:00 pm to discuss additional topics of interest that were placed on a flip-chart throughout the two days of discussion. These topics were termed "Parking Lot" items.

The following Parking Lot items discussed were: (1) chemical precipitation, (2) status of Los Alamos National Laboratory latent debris research, (3) treatment of latent debris in baseline analysis, (4) reflective metallic insulation transport during pool fill, (5) baseline analysis too bounding, (6) high-energy line break in proximity of the sump, and (7) conflict between radiation control and ensuring adequate flow paths.

Attachment 13 contains the draft proposed generic letter, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized Water Reactors."

The last items discussed were the schedule and actions. NEI stated that the Baseline Analysis document would be submitted to the NRC on April 19, 2004. NEI stated that the document would be a final, stand alone document. NEI also stated that the Supplemental Guidance and the response to the NRC RAI questions in Attachment 11 would be submitted on May 28, 2004. NEI requested to have the following meetings in April 2004: (1) risk-informed alternate break size and (2) interim safety assessment. The NRC staff stated that a draft generic letter meeting for public comments will be held in April or May 2004. The NRC staff also stated that a public meeting will be held in May or June 2004, regarding the review of the PWR Containment Sump Evaluation Methodology - Baseline Analysis and Supplemental Guidance. In addition, the NRC plans to have meetings with the Advisory Committee on Reactor Safeguards (ACRS). In June 2004, the NRC staff plans to meet with the ACRS subcommittee regarding the PWR Containment Sump Evaluation Methodology. In July 2004, the NRC staff plans to meet with the ACRS subcommittee regarding the approval of the generic letter. In September 2004, the NRC staff plans to meet with full ACRS committee regarding the approval of the generic letter.

In closing the meeting, the NRC staff notified the participants of the NRC Public Meeting Feedback form and encouraged them to complete the form and mail it into the NRC.

Attachments:

1. Meeting Attendees on March 23, 2004
2. Meeting Attendees on March 24, 2004
3. Meeting Agenda
4. "GSI-191 Evaluation Methodology Overview"
5. "Overview of the Baseline Document"
6. "PWR Containment Sump Baseline Evaluation Methodology - Break Selection"
7. "PWR Containment Sump Baseline Evaluation Methodology - Debris Generation"
8. "PWR Containment Sump Baseline Evaluation Methodology - Latent Debris"
9. "PWR Containment Sump Baseline Evaluation Methodology - Debris Characteristics"
10. "GSI-191 Evaluation Methodology Supplemental Guidance"
11. "NRC Draft RAI Questions Regarding the NEI Draft PWR Containment Sump Evaluation Methodology Guidelines"
12. "Cross-Reference Between Detailed RAI's and Preliminary Review of NEI's Draft PWR Containment Sump Evaluation Methodology Guidelines"
13. Draft Proposed Generic Letter, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized Water Reactors"

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  11. "NRC Draft RAI Questions Regarding the NEI Draft PWR Containment Sump Evaluation Methodology Guidelines"
  12. "Cross-Reference Between Detailed RAI's and Preliminary Review of NEI's Draft PWR Containment Sump Evaluation Methodology Guidelines"
  13. Draft Proposed Generic Letter, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized Water Reactors"

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| NAME   | JLamb      | THarris    | LRaghavan  |
| DATE   | 4/20/04    | 4/13/04    | 4/22/04    |

ADAMS Accession Nos. ML040930062 (Meeting Summary)  
 ML040980355 (Attachments 3 - 10)  
 ML041000330 (Attachments 11 - 13)  
 ML040930089 (Package)

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Summary of March 23 and 24, 2004, Meeting between The Nuclear Regulatory Commission Staff and Stakeholders concerning Generic Safety Issue 191, "Assessment of Debris Accumulation on PWR SUMP Performance"

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LIST OF ATTENDEES  
MEETING REGARDING GENERIC SAFETY ISSUE 191,  
"ASSESSMENT OF DEBRIS ACCUMULATION ON PWR SUMP PERFORMANCE"  
TUESDAY, MARCH 23, 2004

| <u>NAME</u>     | <u>ORGANIZATION</u>                        |
|-----------------|--|
| J. Lamb         | NRC/NRR/DLPM                               |
| M. Marshall     | NRC/NRR/DLPM                               |
| M. Johnson      | NRC/NRR/DSSA                               |
| R. Architzel    | NRC/NRR/DSSA                               |
| S. Weerakkody   | NRC/NRR/DSSA                               |
| M. Kowal        | NRC/NRR/DSSA                               |
| A. Lavretta     | NRC/NRR/DSSA                               |
| W. Kemper       | NRC/OIG                                    |
| A. Hsia         | NRC/RES/DET                                |
| R. Caruso       | NRC/ACRS                                   |
| E. McKenna      | NRC/NRR/DRIP                               |
| B. Letellier    | Los Alamos National Lab                    |
| C. Shaffer      | ARES                                       |
| J. Butler       | Nuclear Energy Institute                   |
| A. Pietroangelo | Nuclear Energy Institute                   |
| T. Andreychek   | Westinghouse                               |
| B. Bryan        | TVA  |
| R. Oakley       | Duke Energy                                |
| M. Kostelnik    | Constellation Energy Group                 |
| C. Feist        | TXU Energy                                 |
| A. Smith        | Enercon Services                           |
| B. Peterson     | Sargent & Lundy                            |
| M. Dingler      | WCNOC/WOG                                  |
| D. Lochbaum     | Union of Concerned Scientists              |
| J. Cavallo      | Corrosion Control Consultants & Labs, Inc. |
| J. Gisclon      | EPRI                                       |
| A. Ricker       | Proto-Power                                |
| T. Schiffey     | WOG/Exelon                                 |
| W. Rinkecs      | Westinghouse                               |
| M. Friedman     | OPPD                                       |
| W. Schulz       | South Texas Project                        |
| J. Loya         | South Texas Project                        |
| J. Garcia       | Florida Power & Light                      |
| C. Gilles       | EDF  |
| G. Quitoriano   | PG&E                                       |
| J. Walker       | AREVA                                      |
| G. Bischoff     | Westinghouse/WOG                           |
| E. Wolbert      | Transco                                    |
| S. Cimorelli    | GE   |
| P. Mast         | Alion Science & Technology                 |
| A. Drake        | Constellation Energy Group                 |
| G. Zigler       | Alion Science & Technology                 |

NRR = Office of Nuclear Reactor Regulation  
DLPM = Division of Licensing Project Management  
DSSA = Division of Systems Safety and Analysis  
DRIP = Division of Regulatory Improvement Programs  
RES = Office of Nuclear Regulatory Research  
DET = Division of Engineering Technology  
ACRS = Advisory Committee for Reactor Safeguards  
OIG = Office of the Inspector General

LIST OF ATTENDEES  
MEETING REGARDING GENERIC SAFETY ISSUE 191,  
“ASSESSMENT OF DEBRIS ACCUMULATION ON PWR SUMP PERFORMANCE”  
WEDNESDAY, MARCH 24, 2004

| <u>NAME</u>   | <u>ORGANIZATION</u>                        |
|---------------|--|
| J. Lamb       | NRC/NRR/DLPM                               |
| M. Marshall   | NRC/NRR/DLPM                               |
| M. Johnson    | NRC/NRR/DSSA                               |
| R. Architzel  | NRC/NRR/DSSA                               |
| S. Weerakkody | NRC/NRR/DSSA                               |
| M. Kowal      | NRC/NRR/DSSA                               |
| A. Lavretta   | NRC/NRR/DSSA                               |
| W. Kemper     | NRC/OIG                                    |
| TY Chang      | NRC/RES/DET                                |
| R. Caruso     | NRC/ACRS                                   |
| B. Letellier  | Los Alamos National Lab                    |
| C. Shaffer    | ARES                                       |
| J. Butler     | Nuclear Energy Institute                   |
| T. Andreychek | Westinghouse                               |
| B. Bryan      | TVA  |
| R. Oakley     | Duke Energy                                |
| G. Hamrick    | Duke Energy                                |
| B. Davenport  | Exelon                                     |
| M. Kostelnik  | Constellation Energy Group                 |
| C. Feist      | TXU Energy                                 |
| A. Smith      | Enercon Services                           |
| B. Peterson   | Sargent & Lundy                            |
| M. Dingler    | WCNOC/WOG                                  |
| J. Cavallo    | Corrosion Control Consultants & Labs, Inc. |
| J. Gisclon    | EPRI                                       |
| A. Ricker     | Proto-Power                                |
| G. Geaney     | MPR Associates                             |
| W. Rinkecs    | Westinghouse                               |
| M. Friedman   | OPPD                                       |
| W. Schulz     | South Texas Project                        |
| J. Loya       | South Texas Project                        |
| J. Garcia     | Florida Power & Light                      |
| C. Gilles     | EDF  |
| B. Philippe   | EDF  |
| G. Quitarano  | PG&E                                       |
| S. Cimorelli  | GE   |
| P. Mast       | Alion Science & Technology                 |
| D. Lincoln    | Alion Science & Technology                 |
| A. Drake      | Constellation Energy Group                 |
| G. Zigler     | Alion Science & Technology                 |

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